

ABSTRACT

Ultra-high-strength linepipes having excellent low-temperature toughness manufactured by welding together
5 the edges of steel plates comprising C of 0.03 to 0.07 mass%, Si of not more than 0.6 mass%, Mn of 1.5 to 2.5 mass%, P of not more than 0.015 mass%, S of not more than 0.003 mass%, Ni of 0.1 to 1.5 mass%, Mo of 0.15 to 0.60 mass%, Nb of 0.01 to 0.10 mass%, Ti of 0.005 to 0.030 mass%, Al of not more than 0.06 mass%, one or more of required amounts of B, N, V, Cu, Cr, Ca, REM (rare-earth metals) and Mg, with the remainder consisting of iron and unavoidable impurities and having a $(Hv\text{-ave})/(Hv\text{-M})$ ratio between 0.8 and 0.9 at $2.5 \leq P \leq 4.0$, wherein $Hv\text{-ave}$ is
10 the average Vickers hardness in the direction of the thickness of the base metal and $Hv\text{-M}$ is the martensite hardness depending on C-content ($Hv\text{-M} = 270 + 1300C$) and a tensile strength $TS\text{-C}$ between 900 MPa and 1100 MPa; $P = 2.7C + 0.4Si + Mn + 0.8Cr + 0.45(Ni + Cu) + (1 + \beta)Mo - 1$
15 + β ($\beta = 1$ when $B \geq 3$ ppm and $\beta = 0$ when $B < 3$ ppm).
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